REMARKS

Rejection of claims 1-25 is maintained under 35 U.S.C. § 102(b) over *Patrick et al.*, U.S. Patent No. 5,706,483 (hereinafter "*Patrick*"). By this amendment, independent claim 1 is amended to include the subject matter of claim 2. Likewise, independent claim 11 is amended to include the subject matter of claim 12. In addition, independent claim 21 is also amended to include the subject matter substantially similar to the subject matter of claim 2. Finally, claims 3, 5, 6, 9, 13, 15, 16, 19, 22 and 23 are amended to clarify the Applicant's intended invention. As dependent claims 2 and 12 have been cancelled, incorporating the subject matter included therein in the respective independent claims, no new matter is raised by the amendments that would require a further search or consideration by the Examiner.

As amended, independent claim 1 calls for a method including writing the pixel data to a first virtual memory location for performing a first pixel transformation and generating a virtual memory address for a second memory location for writing the transformed pixel data from the first virtual memory location to the virtual memory address of the second memory location. Finally, the pixel data is transferred to a memory controller using a memory controller client.

However, the *Patrick* reference fails to teach or disclose the transformation of pixel data from a first to a second memory location in a virtual memory space before transferring the pixel data to a memory controller using a memory controller client. Use of virtual memory mapping with a write-through for performing own pixel transformation operation and address translation at a virtual memory location is absent in the *Patrick* reference. Instead, *Patrick*, in the process of transferring a data block from a source to a destination in memory, involves passing as parameters the location of the source and destination while each byte in the data block must be fetched (i.e., read) from a source address and written to a destination address. See column 5, lines 14-20 and column 6, lines 27-31.

Thus, transferring a data block from a source to a destination in memory, involves fetching or reading data from the source address before writing to the destination address. This precludes a one-way transformation and manipulation of pixel data by writing the pixel data from one virtual memory location to another virtual memory location, as now claimed in claim 1.

Rather, the *Patrick* reference teaches writing data to a memory location after reading from a different memory location.

With respect to inherency, to establish anticipation, the general rule is that inherency may be relied upon where, but only where, the consequence of following the reference disclosure always inherently produces or results in the claimed invention. The Applicant, however, respectfully submits that this is not so. Accordingly, the *Patrick* reference fails identically to disclose the claimed invention and, therefore, does not anticipate. In particular, the *Patrick* reference fails to teach or disclose virtual memory mapping based transformation and manipulation of pixel data as claimed in claim 1. Nowhere does the *Patrick* reference teach or disclose use of virtual memory space for pixel transformations and address translation, resulting in a forward, write-through video/graphics operation.

In a conventional graphics/video engine architecture of the type commonly seen in mainstream PC systems, such as described in the *Patrick* reference, transformations like color space conversion and scaling on pixels are performed in an "active" fashion. Pixels are first generated and deposited into memory as the result of some drawing operation (e.g., 3D or video-based rendering). To impose additional operations, like color space conversion or scaling, those pixels are then typically fetched from memory by an explicit memory "fetch" engine, the operation is imposed, and the pixels are written back to memory. The imposition of the transformation is "actively" applied because it requires an explicit fetch engine to be set up with the parameters of the operation.

In contrast, the invention claimed in claim 1 enables the passive application of imaging and video functions like color space conversion and scaling through the mapping of these functions into virtual memory space. An application writes pixels to a range of virtual memory addresses, a "passive" engine imposes the chosen operation, a new "re-mapped" memory address is generated, and the pixels are written to the new memory location. Any of a large number of operations (including scaling, color conversion, composition, etc.) can be implemented into this architecture.

Therefore, as amended, independent claim 1 and the claims dependent therefrom are in condition for allowance. Amended independent claim 11 calls for an article claim that

corresponds to claim 1. For at least the reasons indicated above, claim 11 and the claims dependent therefrom cannot be anticipated by the *Patrick* reference.

With respect to claim 21, which is directed to a system including a memory controller that receives pixel data and virtual memory addresses, a first memory controller client forwards pixel data and addresses to a first transfer function, and a second memory controller client receives data from the first transfer function together with the new virtual memory addresses. There is not a remote hint whatsoever provided in the *Patrick* reference as to using two separate memory controller clients as claimed in claim 21.

Use of two separate memory controller clients, one forwarding pixel data and virtual memory addresses to a first transfer function and the second receiving the pixel data from the transfer function together with new virtual memory addresses is absent from the *Patrick* reference. In this manner, the Applicant respectfully submits that the amended independent claim 21 and the claims dependent therefrom are also patentably distinguishable over the *Patrick* reference since the cited reference fails to teach or suggest the Applicant's claimed invention therein. The Examiner is respectfully requested to reconsider the pending claims.

Attached is an Appendix, which shows the changes to the claims. The Examiner is encouraged to review those changes to ensure that the claims, as set forth herein, correspond accurately to the claims in the appendix and no inadvertent errors have occurred.

In view of these remarks and amendments, the application is now in condition for allowance and the Examiner's prompt action in accordance therewith is respectfully requested.

Respectfully submitted,

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APPENDIX

1. A method comprising:

writing pixel data to a first virtual memory location;

performing a first pixel transformation at said first virtual memory location;

generating a virtual memory address for a second memory location;

writing said transformed pixel data from said first virtual memory location to said virtual memory address of said second memory location; and

transferring said pixel data to a memory controller using a memory controller client.

2. Cancelled.

3. The method of claim [2] 1 further including writing pixel data to a virtual memory location associated with a memory controller client that receives pixel data written to certain virtual addresses.

5. The method of claim 1 wherein generating said virtual memory address for said second memory location includes transforming the addresses of said pixel data at said first virtual memory location to addresses at said second memory location.

6. The method of claim 5 including determining the offset to pixel data by subtracting a base address at said first virtual memory location from the address of pixel data.

9. The method of claim 1 wherein writing said transformed pixel data from said first virtual memory location to said second memory location includes writing said pixel data from said first virtual memory location associated with a first transfer function to said second memory location associated with a second transfer function.

11. An article comprising a medium storing instructions that enable a processor-based system to:

write pixel data to a first virtual memory location;

perform a first pixel transformation at said first virtual memory location;

generate a virtual memory address for a second memory location; [and]

write said transformed pixel data from said first virtual memory location to the virtual memory address of said second memory location; and

transfer said pixel data to a memory controller using a memory controller client.

12. Cancelled.

13. The article of claim [12] 11 further storing instructions that enable the processor-based system to write pixel data to a virtual memory location associated with a memory controller client that receives pixel data written to certain virtual addresses.

15. The article of claim 11 further storing instructions that enable the processor-based system to transform the addresses of pixel data at said first virtual memory location to addresses at said second memory location.

16. The article of claim 15 further storing instructions that enable the processor-based system to determine the offset to each pixel data by subtracting a base address at said first virtual memory location from the address of each pixel data.

19. The article of claim 11 further storing instructions that enable the processor-based system to write said pixel data from said first virtual memory location associated with a first transfer function to said second memory location associated with a second transfer function.

21. A system comprising:

a memory controller that receives pixel data and virtual memory addresses;

a first memory controller client that forwards the pixel data and virtual memory addresses to a first transfer function; and

a second memory controller client that receives data from said first transfer function together with new virtual memory addresses.

22. The system of claim 21 wherein said first memory controller client selectively forwards the pixel data and virtual memory addresses to one of a plurality of transfer functions and said second memory controller client receives the pixel data with new virtual memory addresses from said plurality of transfer functions.

23. The system of claim 22 wherein said second memory controller client writes the pixel data back to said memory controller.

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